
NASA-08711 (December 2003)
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DIVISION 08 - DOORS AND WINDOWS

SECTION 08711

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12/03

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SECTION 08711

HANGING HARDWARE
12/03

NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers builder's finish hardware, locks and door trim, hinges, closers, door stops, UL-listed fire exit hardware, pulls, plates, and miscellaneous hardware.

This section does not include cabinet hardware, hardware for factory-finished counters and cabinets, folding partitions, laboratory or kitchen equipment, toilet partitions and doors, metal lockers, or equipment which normally is furnished complete with hardware.

Drawings must indicate door locations and swing, must schedule rooms, type of door frame, type of door, door elevation and dimensions, door-accessory fittings, and details which will affect the size and design of hardware fittings.

PART 1 GENERAL

1.1 REFERENCES

NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically be deleted from this section of the project specification.

The publications listed below form a part of this section to the extent referenced:

ALUMINUM ASSOCIATION (AA)

AA 45 (1997) Designation System for Aluminum
Finishes

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

BHMA A156.1 (1988) Butts and Hinges
BHMA A156.16 (1989) Auxiliary Hardware
BHMA A156.18 (1987) Materials and Finishes
BHMA A156.2 (1989) Bored and Preamsembled Locks and
Latches
BHMA A156.3 (1994) Exit Devices
BHMA A156.4 (1992) American National Standards for
Door Controls - Closers
BHMA A156.5 (1992) Auxiliary Locks & Associated
Products
BHMA A156.6 (1994) Architectural Door Trim
BHMA A156.8 (1994) Door Controls - Overhead Holders

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS A-A-1927 (Rev C) Padlocks

UNDERWRITERS LABORATORIES (UL)

UL Elec Const Dir (2001) Electrical Construction Equipment
Directory

1.2 SUBMITTALS

**NOTE: Review submittal description (SD) definitions
in Section 01330, "Submittal Procedures," and edit
the following list to reflect only the submittals
required for the project. Submittals should be kept
to the minimum required for adequate quality
control. Include a columnar list of appropriate
products and tests beneath each submittal
description.**

The following shall be submitted in accordance with Section 01330,
"Submittal Procedures," in sufficient detail to show full compliance with
the specification:

SD-01 Preconstruction Submittals

Material, Equipment and Fixture Lists for finish hardware shall be submitted in accordance with paragraph entitled, "Finish Hardware Information," of this section.

SD-02 Shop Drawings

Installation Drawings for finish hardware shall be submitted in accordance with paragraph entitled, "Drawings," of this section.

SD-03 Product Data

Manufacturer's catalog data shall be submitted for the following items:

- Fasteners
- Hinges
- Locksets
- Door Roller Latches
- Deadlocks
- Night Latches
- Exit Bolts
- Push and Pull Bars
- Pulls and Push Plates
- Thresholds
- Lever Extension Flush Bolts
- Closers
- Coordinating Device
- Miscellaneous and Shelf Hardware
- Weatherstripping Materials

SD-04 Samples

Samples of each type of the following shall be submitted by the Contractor, including lock cylinder and construction core properly marked and tagged for identification. Samples that are on file at Federal Supply Service, 7th and D Street, S.W., Washington, DC, 20407, shall be identified with an "F" on the sample tag. Samples that are not on file shall be identified with and "NF" on the sample tag.

- Fasteners
- Hinges
- Locksets
- Door Roller Latches
- Deadlocks
- Night Latches
- Exit Bolts
- Push and Pull Bars
- Pulls and Push Plates
- Thresholds
- Lever Extension Flush Bolts
- Closers

Coordinating Device
Miscellaneous and Shelf Hardware
Weatherstripping Materials
Removable Mullions

SD-06 Test Reports

Test reports shall be submitted for the following in accordance with paragraph entitled, "Sampling and Testing," of this section.

Thickness of Plating
Anodic Film
Finish and Color
Salt Spray Tests
Accelerated Aging
Flammability
Deformation
Colorfastness

SD-07 Certificates

Certificates shall be submitted for the following items showing conformance with the referenced standards contained in this section.

Fasteners
Hinges
Locksets
Door Roller Latches
Deadlocks
Night Latches
Exit Bolts
Push and Pull Bars
Pulls and Push Plates
Thresholds
Lever Extension Flush Bolts
Coordinating Device
Miscellaneous and Shelf Hardware
Weatherstripping Materials

SD-10 Operation and Maintenance Data

Contractor shall operation and maintenance manuals for Finish Hardware Items in accordance with paragraph entitled, "Finish Hardware Information," of this section.

1.3 DELIVERY

Hardware shall be delivered wrapped and sealed in the manufacturer's original cartons complete with the correct fastenings.

Each item of hardware shall be labeled for room and location and identified with the proper door frame and hardware schedule number.

1.4 TEMPLATES

Hardware to be attached to metal shall be made to a template.

1.5 FINISHES

Hardware shall receive the following finish(es) conforming to BHMA A156.18, as indicated:

Satin bronze: 612 on bronze, 639 on steel

Satin chrome: 626 on brass or bronze, 652 on steel

Satin aluminum: 628

Satin corrosion-resistant steel: 630

Plastic laminate: Black or brown

[Where a satin bronze finish approximating the color of 612 or 639 cannot be obtained in the specified articles of hardware or parts thereof, such parts shall be electroplated to match the specified finish.]

[Aluminum hardware items shall be anodized to an Architectural Class II natural finish not less than 0.4 mil 0.01 millimeter thick conforming to AA 45 (designation AA M21 C22 A31).]

1.6 FINISH HARDWARE INFORMATION

Material, Equipment and Fixture Lists for finish hardware shall be provided prior to the hardware schedule, consisting of a list of the proposed finish hardware by manufacturer, type, name, series, material, and finish.

Contractor shall submit [6] [_____] copies of Operation and Maintenance Manuals for Finish Hardware Items. Data shall be updated and resubmitted for final approval no later than 30 calendar days prior to contract completion.

Operation and maintenance manuals shall be consistent with manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Test data shall be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading. Pages for vendor data and manuals shall have 3/8-inch 10 millimeter holes and be bound in 3-ring, loose-leaf binders. Data shall be organized by separate index and tabbed sheets, in a loose-leaf binder. Binder shall lie flat with printed sheets that are easy to read. Caution and warning indications shall be clearly labeled.

Contractor shall provide classroom and field instructions in operation and maintenance of systems equipment where required by the technical provisions. These services shall be directed by the Contractor, using the manufacturer's factory trained personnel or qualified representatives. Contracting Officer shall be given 7 calendar days written notice of

scheduled instructional services. Instructional materials belonging to the manufacturer or vendor; e.g., lists, static exhibits, visual aids, shall be made available to the Contracting Officer.

1.7 DRAWINGS

Installation Drawings for finish hardware shall include a hardware schedule indicating the door and frame location, type, size, swing, bevel, material, hardware type by Builders' Hardware Manufacturer's Association (BHMA) numbers, and the respective manufacturer's type, name, number, finish, and design.

1.8 SAMPLING AND TESTING

Test reports shall include tests for Thickness of Plating, Anodic Film, Finish and Color, Salt Spray Tests for metals, Accelerated Aging, Flammability, Deformation, and Colorfastness for plastic materials.

PART 2 PRODUCTS

2.1 FASTENERS

Fasteners of the proper type, size, quantity, and finish for each hardware item shall be provided. Machine screws and expansion shields shall be used for attaching hardware to concrete, stone, or masonry. Visible fasteners shall be phillips-head, bronze, or corrosion-resistant steel finished to match specified hardware. Screws or bolts for the jamb leaf of half-surface, half-mortise, and full-surface hinges shall be tamperproof.

2.2 HINGES

Hinges shall be button-tip template conforming to BHMA A156.1, finish and type as specified in the hardware schedule.

Hinges for exterior doors shall be bronze or corrosion-resistant steel unless otherwise specified.

Exterior doors and interior reverse bevel doors shall have hinges with nonremovable pins.

Doors 36 inches 915 millimeter wide and wider shall have hinges with ball bearings or oil-impregnated bearings.

Doors hung on offset floor hinges shall have an intermediate pivot.

Doors 5 feet 1525 millimeter and less in height shall have not less than two hinges. One additional hinge shall be provided for each additional 30 inches 760 millimeter in height or fraction thereof.

Hinges shall have leaves of sufficient width to clear the trim but not less than the following sizes:

DOOR THICKNESS

HINGE SIZE

3/4 inch

2 by 2 inches

7/8 inch

2-1/2 by 2 inches

1-1/8 inches

2-1/2 by 2-1/2 inches

1-3/8 inches

3-1/2 by 3-1/2 inches

1-3/4 inches

4-1/2 by 4-1/2 inches

2-1/4 inches

5 by 5 inches

DOOR THICKNESS

HINGE SIZE

20 millimeter

50 by 50 millimeter

22 millimeter

65 by 50 millimeter

28 millimeter

65 by 65 millimeter

35 millimeter

90 by 90 millimeter

45 millimeter

115 by 15 millimeter

57 millimeter

130 by 130 millimeter

Doors wider than 40 inches 1020 millimeter shall have hinges 5 by 4-1/2 inches. 130 by 115 millimeter.

2.3 LOCKSETS

2.3.1 General Requirements

**NOTE: Revise the first paragraph for special design
or for cast trim.**

Locksets and latchsets, except for special-function locks and where indicated otherwise, shall conform to BHMA A156.2, plain design, wrought trim, and shall be the product of a single manufacturer.

Locksets and latchsets shall have standardized fronts, cases, and strikes so that varying functions will be interchangeable and will require only one mortise for their installation. Locks and latches shall have beveled bronze fronts, bronze bolts and strikes, brass hubs, and cases with the finish specified. Locks shall have cylinders conforming to BHMA A156.5.

2.3.2 Master System

Locksets and lock cylinders shall be master keyed to the existing key

system.

2.3.3 Temporary Hardware

Temporary-construction cores shall be furnished, installed, and maintained in locks during construction and removed when directed.

2.3.4 Mortise Types

Locksets and latch sets shall be mortise type, [Grade 2,] [Grade 3,] as specified in the hardware schedule.

Locksets and latch sets for fire-rated doors shall be UL listed and labeled mortise type, Grade 1, as specified in the hardware schedule.

2.3.5 Cylinder Bored-Type

Locksets and latch sets shall be cylinder bored type, [Grade 1,] [Grade 2,] as specified in the hardware schedule.

Locksets and latch sets for fire-rated doors shall be UL listed and labeled with a minimum latch-bolt throw of 3/4 inch, 20 millimeter, cylinder bored type, Grade 1, as specified in the hardware schedule.

2.3.6 Sliding Doors

Locksets for sliding doors shall be the half-mortise latch type with flush pull, Type E06161.

2.4 TUBULAR CYLINDER DEADLOCKS AND NIGHT LATCHES

Deadlocks and Night Latches shall conform to BHMA A156.5, finish as specified in the hardware schedule.

2.5 DOOR ROLLER LATCHES

Roller latches shall be the adjustable, spring-loaded type with a forged bronze front and strike conforming to BHMA A156.16, finish as specified in the hardware schedule.

2.6 EXIT BOLTS

Bolts shall conform to BHMA A156.3 and shall be the type, function, and finish specified in the hardware schedule. Exit bolts shall be listed by UL and shall bear the UL label.

2.7 REMOVABLE MULLIONS

**NOTE: Drawings must indicate location, length and
details of mullions.**

Mullions shall conform to BHMA A156.3 and shall be complete with

wrought-steel or cast-iron top and bottom plates, cast-brass or bronze four-way adjustable strike plates, cadmium plated mounting screws, and expansion shield fasteners.

2.8 PUSH AND PULL BARS

Bars shall be the single horizontal type, plain design, conforming to BHMA A156.6, Type J501, fabricated from solid extruded bronze, aluminum, or corrosion-resistant steel, finish as specified. Bar size shall be not less than 1-1/4 by 3/8 inch 32 by 10 millimeter thick, total projection 3/4 inch. 20 millimeter.

Bars shall be a pair of horizontal bars and a vertical pull of a plain design, conforming to BHMA A156.6, Type J502 or J503, fabricated from solid extruded bronze, aluminum, or corrosion-resistant steel, finish as specified. Each bar shall be not less than 1-1/4 by 3/8 inch 32 by 10 millimeter thick, total projection 2-1/4 inches. 57 millimeter. Vertical bar shall be not less than 12 by 1-1/4 by 3/8 inch 300 by 32 by 10 millimeter thick.

2.9 PULLS AND PUSH PLATES

Pulls and push plates shall conform to BHMA A156.6, types and material as specified.

Pulls shall be Type J401, straight design, bronze, corrosion-resistant steel or aluminum, finish as specified, not less than 8 by 1-1/4 inches by 3/8 inch by 1-3/4 inches 200 by 32 millimeter by 10 by 44 millimeter projection, bar profile pull, with rounded edges, through-fastened to the door with two machine screws.

Pulls shall be Type J402, offset design, bronze, corrosion-resistant steel or aluminum, finish as specified, not less than 10 inches by 1 by 2-7/8 inches 250 by 25 by 73 millimeter projection, through-fastened to the door with two machine screws.

Door pulls on plates shall be Type J405, finish as specified, with the wrought plate not less than 14 by 3-1/2 inches by 0.050 inch 355 by 90 by 1.2 millimeter thick, grip center to center, 6 inches, 150 millimeter, with cutouts for cylinders and thumb turns as required.

Flush cup pulls shall be Type J403, finish as specified.

Push plates shall be wrought brass, bronze, aluminum, or corrosion-resistant steel, finish as specified, Type J301 or J302, not less than 3-1/2 by 14 inches by 0.050 inch 90 by 355 by 1.2 millimeter thick, with cutouts for cylinders and thumb turns as required.

2.10 THRESHOLDS

NOTE: The drawings must indicate locations and dimensions of thresholds. BHMA A156.3 is to be specified for use with exit devices.

Aluminum thresholds shall be provided for the full width of the opening at exterior doors.

Thresholds shall be mill-finish extruded aluminum 6063-T5 alloy conforming to BHMA A156.3 or to BHMA A156.6, Type J601, corrugated; Type J602, abrasive; Type J603, interlocking hookstrip; or Type J604, vinyl weatherstrip.

Bronze thresholds shall be provided for the full width of each opening at exterior doors. Thresholds shall be extruded architectural bronze, mill finish, conforming to BHMA A156.6, type as specified.

Thresholds for aluminum doors are specified in Section 08120, "Aluminum Doors and Frames."

2.11 LEVER EXTENSION FLUSH BOLTS

**NOTE: Revise the first paragraph if other than a
12-inch 300 millimeter (12-inch) extension is
required or if applicable codes restrict the use of
manual flush bolts.**

Flush bolts shall be cast or extruded brass or aluminum, finish as specified, conforming to BHMA A156.16, with 12-inch 300 millimeter lever extensions.

Flush bolts shall be a type listed in UL Elec Const Dir for fire-rated doors.

Automatic extension flush bolts shall conform to BHMA A156.3.

2.12 CLOSERS

Closers shall conform to BHMA A156.4, finish, type, and size as specified in the hardware schedule.

Closers shall be provided on emergency fire exits UL labeled, exterior, rest rooms, and general office doors and where specified in the hardware schedule.

Closers shall be the surface-mounted overhead type and shall be the product of a single manufacturer except where not practical and where specifically indicated otherwise. Parallel-arm closers shall be used for outswinging exterior doors, doors under 7 feet 2130 millimeter in height, and when special conditions require parallel-arm operation.

Surface-mounted and concealed overhead closers shall be liquid-controlled rack-and-pinion construction with cast-iron cases and a spindle not less than 9/16 inch 14 millimeter in diameter.

Closer arms shall be fabricated from forged steel or ductile iron. Ductile-iron arms shall be provided for parallel-arm closer operation. Exposed arms of closers shall have a sprayed-on finish matching the lockset or exit-hardware finish.

Fusible-link holders, if permitted, or electromagnetic hold-opens shall be used on closers for fire-rated doors which require hold-open devices.

Hold-open devices shall be provided on closers except those for labeled doors and exterior doors.

Brackets, reinforcing plates, and accessory fittings shall be provided as required.

2.13 COORDINATING DEVICE

A coordinating device shall be provided for each pair of doors with an overlapping astragal or with rabbeted stiles.

Coordinating devices shall conform to BHMA A156.3, bronze or corrosion-resistant steel, finish to match the locksets.

2.14 MISCELLANEOUS AND SHELF HARDWARE

2.14.1 General Hardware Requirements

Miscellaneous hardware shall conform to BHMA A156.16, except as noted, and shall match or have the same finish as lockset finish, except when indicated otherwise.

**NOTE: Drawings must indicate location and
construction details for applicable miscellaneous
hardware items.**

2.14.2 Door Holders

[Lever floor with replaceable rubber tip, Type L01381 or L01391, conforming to BHMA A156.16]

[Floor plunger, Type L01401, L01402, or L01403, conforming to BHMA A156.16.]

[Floor plunger, foot bolt, Type L01421, L01422 or L01423, conforming to BHMA A156.16]

[Concealed overhead slide, automatic, Type C01511, conforming to BHMA A156.8.]

[Surface-mounted overhead slide, automatic, Type C02511, conforming to BHMA A156.8]

2.14.3 Door Stops and Roller Bumpers

Door stops or bumpers conforming to BHMA A156.16 shall be provided to

protect the hardware and prevent doors from striking walls and fixtures.

Wall-mounted door stops Type L02061 or L02101 shall be provided where practical. Where impossible to install wall-mounted stops, floor-mounted stops Type L12141 or L12161 shall be provided.

A roller bumper Type L02191, L02201, or L02211, shall be provided where two swinging doors interfere with each other.

2.14.4 Door Silencers

Door silencers conforming to BHMA A156.16 shall be provided except where specifically indicated otherwise.

Door silencers shall be Type L03011 for metal frames and Type L03021 for wood frames.

Three silencers shall be provided for single doors and four for dutch doors. Two silencers shall be provided for each leaf of pairs of doors for installation in the head rail of the door frame.

2.14.5 Plastic Push and Kick Plates

Push plates shall be 1/8-inch 3 millimeter thick plastic laminate, Type J301, conforming to BHMA A156.6, size as indicated, color as specified.

Kick plates shall be 1/8-inch 3 millimeter thick plastic laminate, Type J106, conforming to BHMA A156.6, color as specified. Width of kick plates shall be 2 inches 50 millimeter less than the door width. Height of kick plates shall be 8 inches 200 millimeter except as indicated. When the bottom rail of the door is less than 8-1/2 inches, 215 millimeter, the kick plates shall extend to within 1/2 inch 13 millimeter of the panel mold or bead.

2.14.6 Metal Kick Plates, Mop Plates, and Armor Plates

NOTE: Plate types are Type J101, armor; Type J102, kick; Type J103, mop; and Type J104, combination.

Plates shall be 0.050-inch 1.2 millimeter thick corrosion-resistant steel, wrought brass, or aluminum, bevel edge, Type J101, Type J102, or Type J103, conforming to BHMA A156.6, finish as specified. Width of kick, mop, and armor plates shall be 2 inches 50 millimeter less than the door width.

Height of kick plates shall be 8 inches 200 millimeter except as indicated.

When the bottom rail of the door is less than 8-1/2 inches, 215 millimeter, the kick plates shall extend to within 1/2 inch 13 millimeter of the panel mold or bead.

2.14.7 Clothes Hooks

Hooks shall be cast or forged brass, bronze, or aluminum, with two hooks projecting 3 inches, 80 millimeter, Type L03111 or L03112, conforming to

BHMA A156.16.

2.14.8 Clothes-Hanger Bars

Bars shall be nickel-plated wrought-brass telescoping tubing with the outer tube not less than 1 inch 25 millimeter in diameter, wall thickness not less than 1/32 inch, 0.8 millimeter, adjustable in sizes from 18 to 144 inches, 455 to 3660 millimeter, and two nickel-plated brass end flanges. Intermediate supports shall be provided on all spans over 48 inches, 1220 millimeter, with one support for spans to 72 inches 1830 millimeter and two supports for spans 72 to 96 inches. 1830 to 2440 millimeter.

Bars shall be chrome-plated heavy-wall steel tubing, 1-1/16 inch 27 millimeter outside diameter, weighing 1.4 pounds per linear foot, 2.1 kilogram per meter, cut to the width of the opening, and two chrome-plated steel wall flanges with two countersunk screw holes. One wall flange shall have an open top. Intermediate supports shall be provided on all spans over 72 inches 1830 millimeter with one support for spans to 108 inches 2745 millimeter and two supports for spans to 144 inches. 3660 millimeter.

2.14.9 Padlocks

Padlocks shall conform to FS A-A-1927, 2-inch 50 millimeter (2-inch) size, six-pin tumbler, with solid-brass case.

2.14.10 Automatic Door Bottom

Door bottom shall be an automatically operating assembly composed of a rubber seal, a metal seal housing, and an automatic operating device mounted on the bottom of the door as indicated. Device shall be designed to seal the space between the bottom of the door and the finished floor when closed and to retract immediately when the door is opened to provide a sill clearance of approximately 1/4 inch. 6 millimeter.

Door bottom shall have an STC rating of [_____].

Door-bottom housing shall be surface-mounted, extruded, anodized aluminum, 1/2 inch wide by 2-1/8 inches 15 millimeter wide by 55 millimeter deep by the full width of the door.

2.14.11 Letter Box Assembly

Plate shall be plain design, forged brass or bronze finish as specified, with an inside cover plate and liner.

2.15 WEATHERSTRIPPING MATERIALS

2.15.1 Door-Sill Weatherstripping

Weatherstripping shall consist of a 1/8-inch 3 millimeter thick by 1-3/8-inch 35 millimeter high neoprene strip housed in an extruded, anodized aluminum housing approximately 0.070 inch 1.8 millimeter thick by 1-1/4 inches 32 millimeter high by the full width of the door and attached to the door with countersunk aluminum screws.

Door-sill weatherstripping shall consist of a 1/8-inch 3 millimeter thick by 1-3/8-inch 35 millimeter high neoprene strip housed in an extruded architectural-bronze housing approximately 0.070 inch 1.8 millimeter thick by 1-1/4 inches 32 millimeter high by the full width of the door and attached to the door with countersunk brass or bronze screws.

2.15.2 Rain Drips

Drip for installation on the door exterior at the sill shall be extruded anodized aluminum approximately 0.094 inch 2.4 millimeter thick by 1-3/8 inches 35 millimeter deep by 3/8-inch 10 millimeter projection.

Drip for installation on the door exterior at the sill shall be an extruded mill-finish architectural bronze approximately 0.094 inch 2.4 millimeter thick by 1-3/8 inches 35 millimeter deep by 5/8-inch 16 millimeter projection.

2.15.3 Meeting Rails

Weatherstripping for pairs of single-acting exterior doors shall consist of 1/8 inch thick by 3/4 inch 3 millimeter thick by 20 millimeter wide feather-edged neoprene strips housed in extruded anodized aluminum Z shape strips 0.065 inch thick by 1 inch 1.6 millimeter thick by 25 millimeter wide by the full height of the opening. There shall be one strip on each leaf overlapping.

Weatherstripping for pairs of single-acting doors shall consist of 1/8-inch 3 millimeter thick by 3/4-inch 20 millimeter taper-edge neoprene strips, housed in extruded architectural bronze Z-shape strip, 0.065 inch thick by 1 inch 1.6 millimeter thick by 25 millimeter wide by the full height of the opening. There shall be one strip on each leaf overlapping.

PART 3 EXECUTION

3.1 GENERAL

Hardware shall be installed and adjusted in accordance with the manufacturer's printed instructions and to template dimensions.

3.2 HARDWARE LOCATION

Hardware shall be located in accordance with the following except when template dimensions and multiple-item installations require alternative locations:

<u>HARDWARE ITEM</u>	<u>LOCATION</u>
Top hinge	Centerline of the hinge shall be not more than 11 inches below the top of the door.
Bottom hinge	Centerline of the hinge shall be not more than 13 inches above the

<u>HARDWARE ITEM</u>	<u>LOCATION</u> finished floor line.
Intermediate hinge	Equidistant between the top and bottom hinges or pivots
Knob lock and latch strike	40-5/16 inches above the finished floor to the center of the lock strike
Deadlock strikes	60 inches above the finished floor to the center of the lock strike
Exit bolt	Aligned in a horizontal position with the centerline of the strike 40-5/16 inches above the finished floor
Roller latches	40-5/16 inches above the finished floor to the center of the strike
Roller bumpers	At the top of the door near the edge of the lock stile
Door closer	Installed and adjusted in accordance with template dimensions. Except where impractical, the closer shall be mounted on the room side of doors opening into corridors, halls, and reception areas.
Door pulls on plates	Centerline of the pull, 42 inches above the finished floor
Door pulls	Centerline of the pull, 42 inches above the finished floor
Pull bar	Centerline of pull bar, 42 inches above the finished floor
Combination push-pull plates	Centerline of the plate, 45-5/16 inches above the finished floor
Push plates	Center of plate 42 inches above the finished floor
Single push bars	42 inches above the finished floor
Double push bars	Centerline 42 inches above the finished floor
Kick plates	Installed on the push side of single-acting doors and on both sides of double-acting doors

<u>HARDWARE ITEM</u>	<u>LOCATION</u>
Extension lever flush bolts	Installed in the edge of the door. Bolt fronts shall be centered in accordance with the length of the lever extension.
<u>HARDWARE ITEM</u>	<u>LOCATION</u>
Top hinge	Centerline of the hinge shall be not more than 280 millimeter below the top of the door.
Bottom hinge	Centerline of the hinge shall be not more than 330 millimeter above the finished floor line.
Intermediate hinge	Equidistant between the top and bottom hinges or pivots
Knob lock and latch strike	1024 millimeter above the finished floor to the center of the lock strike
Deadlock strikes	1525 millimeter above the finished floor to the center of the lock strike
Exit bolt	Aligned in a horizontal position with the centerline of the strike 1024 millimeter above the finished floor
Roller latches	1024 millimeter above the finished floor to the center of the strike
Roller bumpers	At the top of the door near the edge of the lock stile
Door closer	Installed and adjusted in accordance with template dimensions. Except where impractical, the closer shall be mounted on the room side of doors opening into corridors, halls, and reception areas.
Door pulls on plates	Centerline of the pull, 1070 millimeter above the finished floor
Door pulls	Centerline of the pull, 1070 millimeter above the finished floor
Pull bar	Centerline of pull bar, 1070 millimeter above the finished floor
Combination push- pull plates	Centerline of the plate, 1150 millimeter above the finished floor

<u>HARDWARE ITEM</u>	<u>LOCATION</u>
Push plates	Center of plate 1070 millimeter above the finished floor
Single push bars	1070 millimeter above the finished floor
Double push bars	Centerline 1070 millimeter above the finished floor
Kick plates	Installed on the push side of single-acting doors and on both sides of double-acting doors
Extension lever flush bolts	Installed in the edge of the door. Bolt fronts shall be centered in accordance with the length of the lever extension.

3.3 LOCKSET FUNCTIONS

Lockset and latch functions shall be in accordance with BHMA A156.2.

3.4 FINAL ADJUSTMENT

Final hardware adjustments shall be made and maintenance personnel shall be instructed in hardware adjustment, care, and maintenance.

3.5 ADJUSTMENT WRENCHES

Three sets of hardware adjustment wrenches shall be delivered to the Contracting Officer before completion of the project. Each set shall contain adjustment wrenches for locksets, control valve keys for door closers, dogging devices for exit bolts, and emergency keys for toilet lock sets.

3.6 HARDWARE SCHEDULE

NOTE: This paragraph must be developed by the designer in accordance with the requirements of each project.

The schedule must specify the exact item by the referenced specification numbers, trim, design, material, finish, and quantity for each hardware item.

The schedule must locate and schedule each door, door swing, and bevel; dimensions and thickness of the door, whether the door is wood or metal; fire rating, special door requirements, and type of frame.

-- End of Section --